

REMARKS/ARGUMENTS

Claims 1-20 are pending.

35 U.S.C. § 103(a) - Claim 1-20 - the AAPA, the Akram patent, and the Cha patent

Claims 1-20 stand rejected under 35 U.S.C. § 103(a) as being obvious over the Applicants' Admitted Prior Art (hereinafter "the AAPA") in combination with U.S. Patent No. 5,766,982 issued June 16, 1998 to Salman Akram and James Wark (hereinafter "the Akram patent") and U.S. Patent No. 6,242,798 issued June 5, 2001 to Gi-Bon Cha and Byeong-Duck Lee (hereinafter "the Cha patent") (Office Action, pages 2-5).

M.P.E.P. 706.02(j) sets forth the standard for a Section 103(a) rejection:

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaack*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

The Final Office Action relies on the AAPA (i.e., the background section of the present application) for a teaching of a flip chip attached to a substrate with an underfill material dispersed therebetween. Although the AAPA refers to capillary action to draw underfill from an edge of a flip chip, the Final Office Action at page 3 admits that the AAPA fails to disclose forming a through hole extending from the substrate first surface to the substrate second surface and disposing the underfill material through the through hole.

The Akram patent teaches placing a hole through the substrate and dispensing an underfill material therethrough. The Final Office Action at page 4 erroneously contends that the Akram patent teaches "that the underfill material is dispersed by capillary action (col. 1, lines 46-58 and FIG. 5)". The Applicants are respectfully disappointed by the Office's erroneous contention. The cited section of col. 1, lines 46-58 is merely a statement of a prior art teaching that is no different than the prior art teaching in the Applicants' application (i.e., injecting the underfill along two or more sides of the flip-chip and flowing underneath by capillary action). Even though the Akram mentions this method in passing in the Background of the patent, it is neither taught nor suggested that it can be used in the Akram invention. In fact, it is quite the opposite, the Akram invention teaches away from dispersing by capillary action, as it teaches tipping the assembly in order get the underfill material to flow between the microelectronic die and the substrate. In fact, the figure that the Office cites (i.e., FIG. 5) uses a dam 40 to prevent the flow of the underfill material from between the substrate and the microelectronic die. The Office is respectfully reminded that a prior art reference also must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention. M.P.E.P. § 2141.02, citing, *W. L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984). Clearly, the Akram patent neither teaches nor suggest disposing an underfill material through said through-hole such that said underfill material is dispersed by capillary action between the microelectronic die active surface and the substrate first surface.

The Office is respectfully reminded, as set forth in MPEP "The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior

art also suggests the desirability of the combination.” *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990). Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teachings, suggestion, or motivation to do so found in the references, *In re Fine*, 837 F.2d 1071 (Fed. Cir. 1988); *In re Jones*, 958 F.2d 347 (Fed. Cir. 1992). A showing of a suggestion, teaching, or motivation to combine prior teachings “must be clear and particular.” *In re Dembiczak*, 175 F.3d 994, 50 U.S.P.Q.2d 1614 (Fed. Cir. 1999). A teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on Appellants’ disclosure. *In re Vaack*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). The Applicants could find no teaching or suggest within the prior art (i.e., Akram patent nor the AAPA) to combine the references in a manner which would render the presently claims obvious.

The Cha patent is relied upon for teaching “that epoxy can be applied from the top down through a through hole instead of injected upward.” It was assumed that the Examiner was referring to claims 7-12 and 20, as they are the only claims that contain such a limitation. However, the Cha patent also does not teach or suggest to dispersing the epoxy material by capillary action.

Furthermore, “[i]n order to rely on a reference as a basis for rejection of an applicant’s invention, the reference must either be in the field of applicant’s endeavor or, if not, then be reasonably pertinent to the particular problem with which the invention was concerned.” *In re Oetiker*, 977 F.2d 1443, 1446, 24 USPQ2d 1443, 1445 (Fed. Cir. 1992) (See M.P.E.P. 2141.01(a)). The Cha patent involves a different field of endeavor, as it is merely encapsulating

a wirebonded chip with an encapsulation material. The Cha patent teaches dispensing an encapsulant material (i.e., epoxy resin) into what is in essence a closed container (see FIG. 5B of the Cha patent). The presently claimed invention is a flip-chip configuration wherein there is a gap around the periphery of the flip-chip microelectronic die, not a "closed container", as shown in the Cha patent. Thus, with such a gap, conventional wisdom would assume that dispensing the underfill material with the microelectronic die gravitationally below the substrate would result in the underfill material running out of the gap and dripping from the microelectronic die. Thus, it should be clear that encapsulating a wirebonded chip in a closed container is a different endeavor from dispensing the underfill material as described in the present invention.

Therefore, it respectfully appears to the Applicant that the Office has impermissibly taken isolated, non-analogous art and used the claimed invention as template to piece together the teachings of the prior art so that the claimed invention is rendered obvious. It also appears the Office did not take into account only knowledge which was within the level of ordinary skill in art at the time the claimed invention was made and includes knowledge gleaned from the Applicants' disclosure, thus the reconstruction is improper. *In re McLaughlin*, 443 F.2d 1392, 1395, 170 USPQ 209, 212 (CCPA 1971).

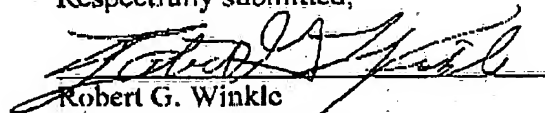
Thus, as neither the AAPA, the Akram patent, nor the Cha patent teach or suggest the presently claimed invention, Applicant respectfully requests reconsideration and withdrawal of the Section 103(a) rejection of claims 1-20 are respectfully requested.

In view of the foregoing remarks, the Applicants request allowance of the application. Please forward further communications to the address of record. If the Examiner needs to

contact the below-signed attorney to further the prosecution of the application, the contact number is (208) 433-9217.

Dated: June 1, 2004

Respectfully submitted,



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